FIVE-YEAR REVIEW REPORT
WAUSAU GROUNDWATER SUPERFUND SITE
WAUSAU, WISCONSIN
JULY, 2000

I. INTRODUCTION

Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by SARA and Section 300.430(f)(4)(ii) of the National Contingency Plan (NCP), require that periodic (no less often than five years) reviews are to be conducted for sites where hazardous substances, pollutants or contaminants remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of all remedial actions for the site. The purpose of such a review is to assess whether the remedial actions implemented continue to be protective of human health and the environment. This review focuses on the protectiveness of the Wausau Groundwater Superfund Site (Site) located in Wausau, Wisconsin.

The United States Environmental Protection Agency (U.S. EPA) has established a three-tier approach (with a sub-tier Level Ia) to conducting Five-Year Reviews, the most basic of which provides a minimum protectiveness evaluation (Level Ia review). U.S. EPA contemplates that a Level I review will be appropriate in all but relatively few cases where site-specific considerations suggest otherwise. The second and third levels (Level II and Level III) of review are intended to provide the flexibility to respond to varying site-specific considerations, employing further analysis. Site-specific considerations, including the nature of the response action, the status of on-site response activities, and the proximity to populated areas and sensitive environmental areas determine the level of review for a given site. A Level I review is being conducted for the Wausau Groundwater Superfund Site.

OSWER Directives 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991), 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) and 9355.7-03A (Supplemental Five-Year Review Guidance, December 21, 1995) provide that U.S. EPA will conduct Five-Year Reviews as a matter of policy (Policy Review) at sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of a remedial action, but the remedial action goals specified in a Record of Decision (ROD), will require five or more years to attain, e.g. long-term response action (LTRA) sites. The two RODs at the Wausau Groundwater Superfund Site established soil and groundwater clean up standards which would allow for eventual unlimited use of groundwater beyond the Wausau Groundwater Site boundaries. To date, these groundwater standards have not been achieved. As a result, groundwater extraction & treatment systems and a soil vapor extraction system continue to operate at the Site.

The Wausau Groundwater Responsible Party Group has conducted the remedial actions at the Superfund Site in accordance with the RODs (signed December 1988 and September 1989), and Remedial Design(RD)/Remedial Action(RA) Consent Decrees(CDs) (entered September 1989 and January 1991). The remedial actions selected for restoration at the Site are effective and protective of human health and the environment.

II. SITE HISTORY AND CONDITIONS

Background

The Wausau Groundwater Site is located at an area in the northern section of Wausau, Wisconsin. The City of Wausau is in north central Wisconsin along the Wisconsin River. There are two source areas associated with groundwater contamination at the Wausau Site. The first source is a former municipal landfill located on the Marathon Electric Corporation property along the west bank of the Wisconsin River. The second source area is located at the Wausau Chemical facility property along the east bank of the river (See Figures 1 & 2).

The City of Wausau provides drinking water for approximately 35,000 people. In 1982, three of the City's deep aquifer production wells (CW3, CW4 & CW6) were found to be contaminated with volatile organic compounds (VOCs). The primary contaminants were tetrachloroethene (PCE), trichloroethene (TCE) and 1,2-dichloroethene (DCE). U.S. EPA awarded the City of Wausau a federal grant in 1983 for design and installation of packed tower VOC air strippers for water supply treatment. However, as high VOC levels persisted, U.S. EPA's emergency response team was called in 1984 to install a granular activated carbon (GAC) treatment system at CW6 until the air strippers for CW3 and CW6 were completed later that year. At that point, CW4 was used only occasionally during peak periods until 1989, and then decommissioned when new production well CW10 went on-line.

A groundwater extraction system with air stripping treatment required by the State of Wisconsin, also began operating at the Wausau Chemical facility in 1985. The system consisted of a series of extraction wells in the shallow portion of the aquifer at the south end of the Wausau Chemical property. The Wausau Chemical groundwater system operated until 1996, when it was shut down and abandoned.

Remedial Planning Activities

Remedial planning began at Wausau Groundwater as the Site was proposed for the National Priorities List on April 10, 1985. The Site became a final NPL listing on June 10, 1986. A two phase remedial investigation (RI) was carried out from August 1987 to September 1988. The significant results of the RI documented in a 1989 report included:

* The City's production wells were located in a wedge shaped aquifer composed of glacial

outwash materials deposited within the pre-glacial bedrock river valley of the Wisconsin River. The aquifer was the sole-source of potable water for the City of Wausau.

* Two separate sources of contamination were identified within the zone of influence of the City's production wells. The first source was a former municipal landfill located south of CW6 on the Marathon Electric property in the west study area. The second source was the Wausau Chemical facility located between CW3 and CW4 in the east study area.

* Three plumes of contamination were found within the zone of influence of the City's production wells. The first was composed primarily of TCE and was emanating from the former municipal landfill. This plume was found to split at the boundary of the source area, with one leg migrating north to CW6 and the second leg migrating under the river to CW3. The second plume originated from the southern boundary of the Wausau Chemical property and impacted both CW3 and CW4. This plume was comprised primarily of PCE, but contained other VOCs as well. The third plume originated from the northern boundary of the Wausau Chemical property and was impacting CW3. This plume was comprised primarily of PCE.

* Soils at both source areas were contaminated with VOCs. The soils in the vicinity of the former municipal landfill were contaminated primarily with TCE. Soils on the Wausau Chemical property were contaminated primarily with PCE, along with other VOCs.

Feasibility study (FS) reports that evaluated remedial alternatives based on the findings of the two phases of the RI were completed in September 1988 and August 1989. U.S. EPA issued an interim ROD in December 1988 that called for a groundwater pump and treatment system to address the contaminant plume emanating from the former municipal landfill. A final ROD, which incorporated the interim ROD with remedy objectives for the Wausau Chemical source areas and plumes, was signed in September 1989.

III. SUMMARY OF RESPONSE ACTIONS

The response actions outlined for the Wausau Groundwater Site in the December 1988 interim ROD included the following remedial components:

* Construction and operation of a treatment system for removal of contaminants.

* Installation of a groundwater extraction well located in the southern portion of the west contaminant plume.

* Discharge of treated water to the Wisconsin River.

* A provision for implementation of an additional well, as necessary.

* An operation and maintenance monitoring program.

The response actions outlined for the Wausau Groundwater Site in the September 1989 final ROD included the following additional components:

* Construction and operation of soil vapor extraction (SVE) systems to remove volatile contaminants from soils at each of the identified source areas.

* Treatment of off-gases from the SVE system operation using vapor phase carbon units, which would be regenerated off-site.

* Groundwater remediation utilizing the City municipal wells and existing air strippers for removal of contaminants from plumes effecting the wells.

* Monitoring of groundwater and soil.

A Consent Decree regarding the December 1988 interim ROD was entered in U.S. District Court in September 1989. The contractor representing the responsible parties completed the remedial design (RD) in March 1990. On-site construction began in June 1990, with the installation of a 16-inch diameter extraction well screened over the bottom 40 feet of the aquifer. The extraction well is located at the north boundary of the former municipal landfill and was originally pumped at 1600 gallons per minute (gpm). The pumping rate was later reduced to 850 gpm following a determination that the higher rate created a groundwater zone of influence too far to the south.

A pump house with associated force main and piping was installed to facilitate treatment and discharge of the extracted groundwater. The groundwater is pumped from the well to the pump house, and is discharged to a manhole storm sewer leading to a fenced rip rap outfall structure designed to enhance volatilization, prior to final discharge into the Wisconsin River. The discharge is to meet the substantive requirements of the Wisconsin Pollution Discharge Elimination System. (WPDES) issued by the Wisconsin Department of Natural Resources (WDNR). A final inspection for the interim remedy was completed in October 1990.

Approval was given by U.S. EPA to Marathon Electric in July 1995 to divert a portion of the extracted water for use in the manufacturing building heat exchanger equipment, before discharge over the rip rap to the Wisconsin River. The groundwater extraction well continues to operate to date at approximately 800 gpm.

A Consent Decree regarding the September 1989 final ROD was entered in U.S. District Court in January 1991. The responsible party contractor completed the RD in June 1993. Construction for the final Site remedy began in October 1993 with the installation of two separate SVE systems. One system was located in the vicinity of the closed landfill on the west side of the Wisconsin River, and included two extraction wells. The second SVE system was located on Wausau Chemical property on the east side of the river, and originally included four wells. Two

additional extraction wells were later added to the east side SVE system. Both SVE systems consisted of the extraction wells, piping manifolds, a water knock out tank, a blower, off-gas vapor phase carbon treatment, and controls. The SVE wells were screened from five feet below grade to the water table, and the off-gas systems consisted of two activated carbon canisters with a sampling port in between. The SVE systems began operation in January 1994.

As part of the final remedy, the City of Wausau was required to operate CW3 and CW6 at rates to enhance the removal of VOCs from the groundwater plumes. utilizing the existing City air strippers. Extracted water is to be treated to acceptable health-based levels in accordance with the Safe Drinking Water Act standards prior to distribution. A final inspection for the final remedy was completed in June 1994. The City well treatment system continues to operate to date.

The responsible party contractor submitted a Mid-Point of Operations Report for the SVE systems in October 1995, following an operation and maintenance soil boring sampling event. After confirmatory soil samples were taken to assure soil clean up levels were achieved, U.S. EPA approved shut down in April 1996 of the SVE system on the west side of the Wisconsin River, and the two northern SVE wells on the east side of the river. Operation of four SVE wells in the southern portion of the system on the east side of the river continues to date.

The responsible party contractor submitted a proposal for a modified groundwater monitoring program in April 2000. The changes from the original groundwater monitoring plan involve a reduction of the number and frequency of monitoring locations, elimination of most semivolatile and metals analysis, and quarterly groundwater sampling at the extraction well instead of monthly. U.S. EPA and WDNR provided comments on the proposal and then approved the modified proposal in June 2000. As a result beginning October 2000, annual groundwater monitoring for primarily VOCs will occur at approximately 30 sampling locations at the Wausau Groundwater Site.

IV. REMEDIAL OBJECTIVES

Groundwater and surface water remedial objectives at the Wausau Groundwater Superfund Site are the attainment of U.S. EPA primary and secondary drinking water maximum contaminant levels (MCLs), and the elimination of any excess lifetime cancer risks according to the Wisconsin Administrative Code Enforcement Standards (ESs), by utilizing groundwater treatment. Soil remedial objectives include the elimination of any excess groundwater leachate, direct contact, ingestion and inhalation human health risks by treatment of contaminated soils. Soil clean up levels for the Wausau Site were determined using a groundwater leachate model, in order to eliminate additional risks for groundwater contamination.

Excess human health risks due to contaminated groundwater are being addressed by the groundwater remedies at the Site. The groundwater extraction well on the Marathon Electric

property continues to operate at approximately 800 gpm. Although significant reductions in groundwater contamination are evident over the years on the west side of the river, it is expected that the extraction well will continue to operate for the foreseeable future, as concentrations in portions of the deep aquifer are well above clean up standards. The City air strippers for CW3 and CW6 continue to treat water in the deep aquifer on both the east and west side of the river. VOC groundwater contamination above clean up standards is still evident at both CW3 and CW6, but these levels are significantly lower than those of previous years.

The SVE soil remedy on the west side of the Wisconsin River has been completed, since U.S. EPA approved closure in April 1996. The SVE system in the southern portion of the Wausau Chemical property on the east side of the river continues to operate and remove VOCs from the soils in that area. VOC soil contamination has decreased substantially at the east side system. Shut down and closure of the east side SVE system is expected before the next Five-Year Review is completed in fiscal year 2005.

V. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Five-Year Review guidance establishes policy for the U.S. EPA to review and analyze the remedial action as it is effected by newly promulgated or modified Federal and State environmental laws. ARARs listed in the 1988 interim ROD and 1989 final ROD pertaining to groundwater remediation, soil remediation, surface water discharge and air discharge at the Wausau Groundwater Superfund Site remain essentially unchanged and are still considered relevant and appropriate.

Groundwater from the extraction well on the Marathon Electric property is discharged to the surface of the Wisconsin River after treatment. This discharge is to meet the substantive requirements under the Wisconsin Pollution Discharge Elimination System (WPDES) issued by WDNR. Groundwater from CW3 and CW6 is treated by City of Wausau air strippers and then mixed with water from other City municipal wells. This effluent discharge is regulated by Safe Drinking Water Act Standards established by U.S. EPA and WDNR.

VI. SUMMARY OF SITE VISITS

The Wausau Groundwater Superfund Site has been visited several times during the operation and maintenance period. The most recent visit and inspection was on June 7, 2000. During the visit the Site groundwater extraction well system and Site soil vapor extraction system were properly maintained. The extraction well pump house and rip rap discharge fence were intact and locked. The City well air strippers were down and being cleaned for a routine maintenance event. With one exception, the groundwater monitoring wells were properly capped and locked.

VII. AREAS OF NONCOMPLIANCE

The remedies selected in the 1988 interim ROD and 1989 final ROD have been implemented and remain functional, operational and effective. As long as the Wausau Groundwater Responsible Party Group continues to operate, maintain and monitor the Site groundwater extraction well and the CW3 & CW6 air strippers; the groundwater remedy should contain and continue to decrease contamination levels in the aquifer. The continued operation of the soil SVE system on the southern end of the Wausau Chemical property ensures that additional groundwater leachate contamination risks are avoided. The rip rap discharge security fence and monitoring well locks provide permanent barriers to prevent human contact and additional risks.

VIII. RECOMMENDATIONS/TECHNOLOGY

U.S. EPA recommends that the Wausau Groundwater Responsible Party Group continue to operate and maintain the groundwater extraction well treatment system and the CW3 & CW6 City of Wausau air strippers, to ensure continued capture and reduction of groundwater contaminants toward clean up standards. Quarterly extraction well and annual groundwater monitoring sampling, with approved U.S. EPA and WDNR modifications, should continue until the remediation requirements outlined in the Site RODs and CDs are achieved.

U.S. EPA recommends continued operation, maintenance and monitoring of the SVE system in the southern portion of the Wausau Chemical property, with previously approved modifications, until soil clean up standards are achieved in this area. Confirmation soil boring sampling, as previously approved, would be needed to verify shut down and closure of the SVE system.

The broken monitoring well casing lock discovered on the Wausau Chemical property during the June 7, 2000 Site inspection should be replaced by the Responsible Party Group contractor, to avoid potential access to the groundwater at the well.

IX STATEMENT ON PROTECTIVENESS

The groundwater and soil vapor extraction treatment systems at the Wausau Groundwater Site continue to operate, and provide adequate protection of human health and the environment. The Site monitoring network program combined with Site security measures provide additional assurance of protection to human health and the environment.

X. NEXT REVIEW

Since hazardous substances, pollutants or contaminants in groundwater are likely to remain above Site remedial action standards, the Wausau Groundwater Site will remain a Superfund

National Priorities List (NPL) Site and require another U.S. EPA Five-Year Review during fiscal year 2005. Continued restrictions on Site land and groundwater use will remain until Wausau Site soil and groundwater clean up standards are achieved.

XI. IMPLEMENTATION REQUIREMENTS

Prior to the next Five-Year Review, the above mentioned recommendations should be implemented and maintained.

for William E. Muno, Director
Superfund Division

July 10, 2002
Date

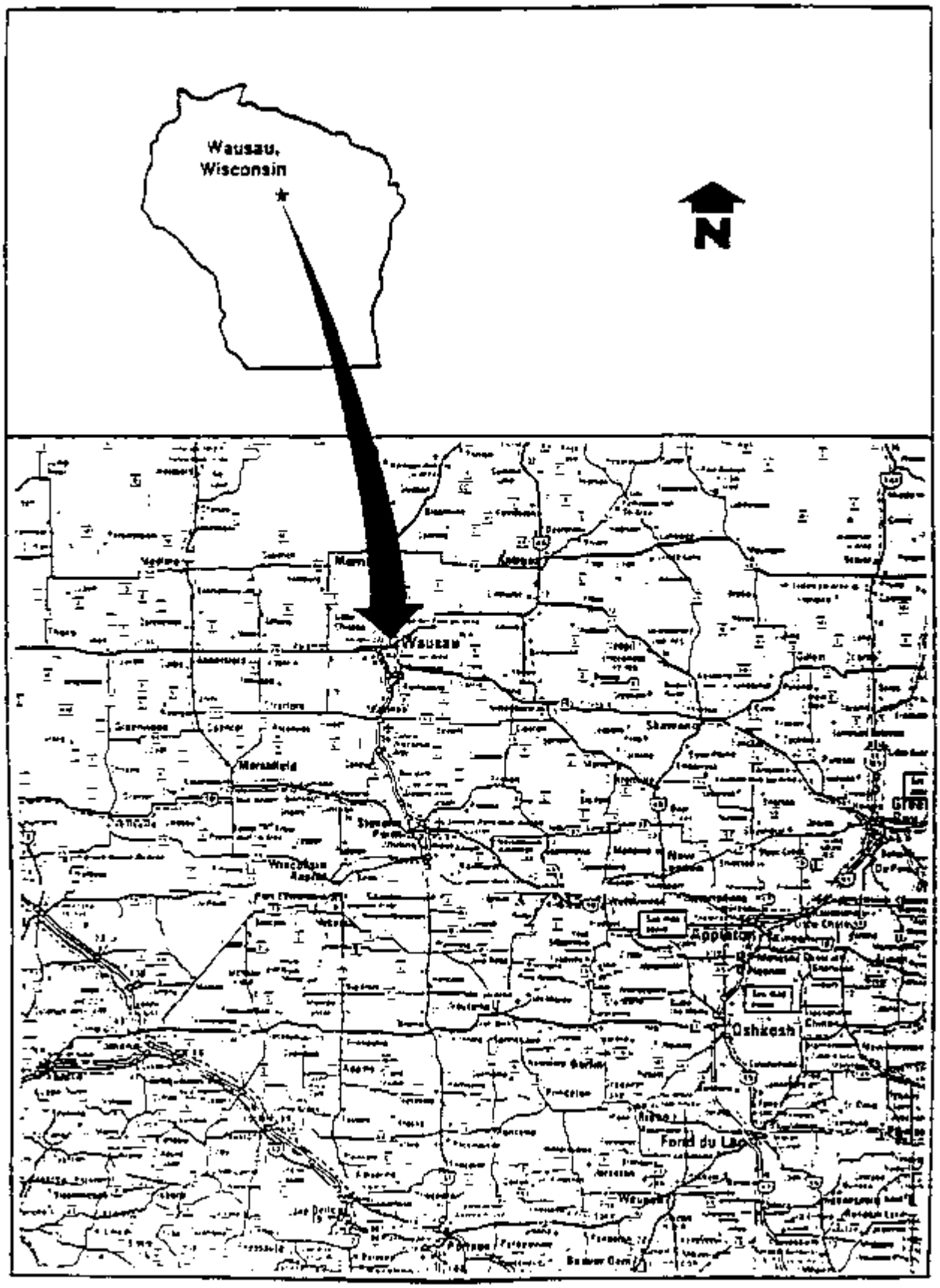

FIGURE 1 REGIONAL LOCATION MAP

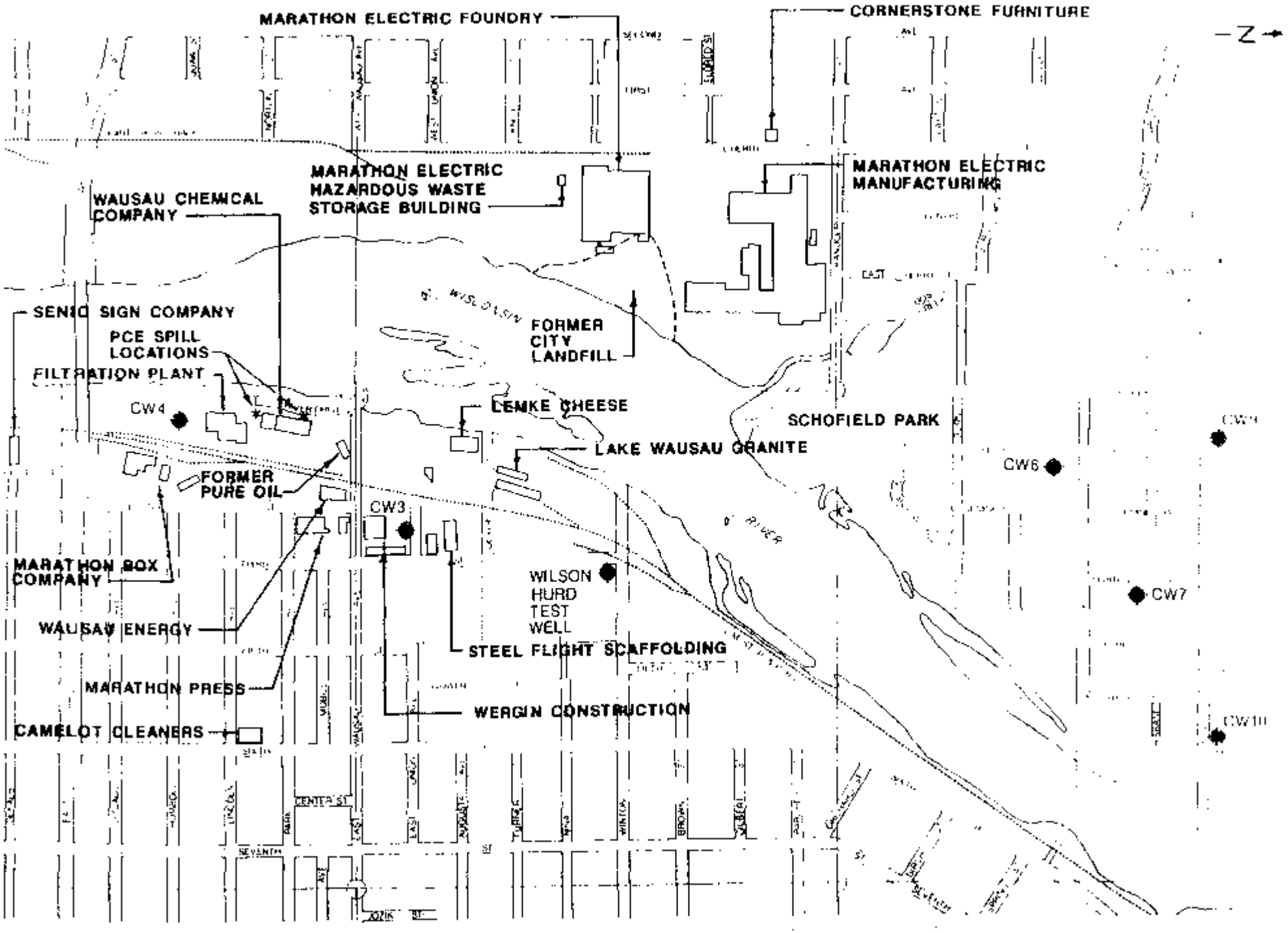
MARATHON ELECTRIC FOUNDRY
CORNERSTONE FURNITURE
N
MARATHON ELECTRIC HAZARDOUS WASTE STORAGE BUILDING
MARATHON ELECTRIC MANUFACTURING
WAUSAU CHEMICAL COMPANY
SENIC SIGN COMPANY
PCE SPILL LOCATIONS
FILTRATION PLANT
CW4
FORMER CITY LANDFILL
LENKE CHEESE
SCHOFIELD PARK
LAKE WAUSAU GRANITE
CW6
FORMER PURE OIL
CW3
MARATHON BOX COMPANY
WILSON HURD TEST WELL
CW7
WAUSAU ENERGY
STEEL FLIGHT SCAFFOLDING
MARATHON PRESS
WERGIN CONSTRUCTION
CAMELOT CLEANERS
CW10

Figure 2